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Application and Countermeasure Analysis of "Flip Classroom" in the Teaching Practice of "Polymer Chemistry"

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Abstract: With the rapid development of information technology, it has had a profound impact on the field of education. The organic integration of information technology and education has made the new teaching model of flipped classroom widely used. This paper makes an in-depth analysis of the application and countermeasures of "Flip Classroom" in the teaching practice of "Polymer Chemistry", and puts forward scientific and reasonable suggestions based on the actual situation, in order to optimize the teaching practice effect of "Polymer Chemistry", improve the teaching level, and give full play to the positive effect.

Keywords: Flipped Classroom; Polymer Chemistry; Teaching Practice

Polymer chemistry is the basic course of polymer materials major, and its foundation is organic chemistry, physical chemistry and other courses. At the same time, it also lays a good foundation for the follow-up professional courses and practical courses. Polymer chemistry is not only a theoretical course, but also an applied course. Optimizing the teaching quality of polymer chemistry courses has a profound impact on cultivating outstanding talents in polymer materials engineering technology. In the traditional teaching mode, the teaching of polymer chemistry mainly relies on teachers' explanations and students take notes. However, because the polymer chemistry class contains a lot of theoretical knowledge, this didactic teaching method is difficult to stimulate students' learning. Interest, the cultivation of students' creative thinking, also can not achieve the desired effect. For a long time, the teaching work of polymer chemistry courses has been in a state of difficult teaching for teachers and difficult for students to learn, which is a major problem in polymer materials engineering technology. The emergence of flipped classroom and its effective application in polymer chemistry have effectively changed the problem of difficult teaching and difficult learning of this course. The flipped classroom teaching mode can effectively stimulate students' enthusiasm for learning, and play a vital role in improving students' autonomy and promoting students' active and autonomous learning of course knowledge. Using the flipped classroom teaching mode, students can be organized to use teaching resources to self-learn the knowledge in polymer chemistry courses before class. Teachers can also organically combine the small group learning mode with the flipped classroom to develop a new teaching mode that subverts the traditional classroom teaching ideas and modes, allowing students to learn knowledge outside the classroom and internalize knowledge in the classroom, thereby effectively optimizing learning. To help students better understand and master the knowledge of polymer chemistry. In addition, due to the close connection between polymer chemistry courses and practical production, this feature is very suitable for the application of the flipped classroom teaching mode. Especially with the development of information technology, with the help of information technology, the application of flipped classroom to carry out polymer chemistry teaching can more easily help students to fully link theory and practice, so that students' practical experience can be effectively enriched. The learning effect of polymer chemistry courses can also rise to a new height. This has very important practical significance for the improvement of the teaching level of polymer materials engineering technology and the training of professional and technical personnel.

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1. Strengthen the indoctrination of the flipped classroom concept

In order to effectively apply the flipped classroom to improve the teaching quality of polymer chemistry, when the flipped classroom teaching is carried out in the first lesson, the flipped classroom teaching method should be introduced to the students in detail. Combined with the specific course content, let students fully understand the various teaching environment, content, specific activities and assessment methods under the flipped classroom teaching mode. Teachers should pay attention to using the method of comparative analysis to effectively compare and analyze the flipped classroom and traditional teaching methods, so that students can fully understand the difference between the two. At the same time, teachers can also show students the achievements of previous students in polymer chemistry courses under the flipped classroom teaching mode, so that students can more intuitively feel the advantages of the flipped classroom teaching mode, so they are more willing to accept the flipped classroom teaching mode subjectively.

The flipped classroom simplifies the deep theoretical knowledge in the polymer chemistry course, and also effectively broadens the teaching content and assessment methods. That is to say, the knowledge content and assessment methods that students need to learn are no longer limited to one test paper. Instead, the process-based assessment method and the group scoring system are used. Under this teaching mechanism, the weak links of students' foundation can be effectively improved, which not only enables students to obtain good academic performance, but also has very important practical significance to help students rebuild their self-confidence and promote the healthy development of students' physical and mental health.

2. Prepare for class

First of all, teachers must prepare lessons before giving lessons. Using various methods such as class lessons, assigning extracurricular learning tasks, or pushing learning materials and test questions to students, teachers can fully understand the actual learning situation of students on the one hand; Knowing in advance and conducting autonomous learning under the guidance of teachers before class, thus forming a certain foundation, plays a vital role in more efficient internalization of knowledge in classroom teaching. In order to facilitate students' learning, teachers can carefully select the content in the learning materials, make short and exquisite videos and upload them to the network, and guide students to conduct independent learning in the form of micro-lectures. It is also possible to use the network platform to build an independent discussion link for answering questions in class, allowing students to discuss independently and communicate with each other, so as to remove learning obstacles as much as possible in the course, and make full preparations for better completion of classroom tasks. .

Secondly, students also need to be fully prepared before class, which has a crucial impact on whether students can efficiently learn polymer chemistry course knowledge. In the flipped classroom teaching mode, students must receive task sheets in time before class, check the learning materials pushed by teachers, and complete relevant test questions. Then, in the group cooperation mode, according to the tasks assigned by the group leader, complete the part that you need to undertake. Students will inevitably encounter certain difficulties in the process of learning in class and completing learning tasks. In this case, students can communicate with each other through the Q&A and discussion in the class, and learn from each other's advanced experience. At the same time, they can also ask teachers for advice to enhance teacher interaction. Under the guidance of teachers, they can actively expand their ideas and diverge. thinking, so as to form a good learning effect.

For example, in the task of "alkyd resin formula design", after completing the task, the difficulty for students is to scientifically judge the impact of formula differences on product differences. At this time, since the teaching assistants have learned this part of the knowledge before the students, they can provide help for the students. By strengthening the communication after class, they can effectively help the students to solve this confusion, and can also guide the students to adapt to the flipped classroom teaching mode more quickly. Students fully appreciate the advantages and characteristics of flipped classroom teaching mode, so as to help students achieve more efficient learning.

3. Effectively optimize the teaching links in the class

Compared with the traditional classroom teaching mode, the biggest feature of the flipped classroom teaching mode is that it can attract students to learn actively and effectively stimulate students' interest in learning. Therefore, in the flipped classroom teaching mode, the design of teaching links must always adhere to the student-centered approach, fully respect the dominant position of students, and carry out teaching activities around students and tasks.

In the first stage, teachers should comment on the completion of the previous learning task, affirm students' successes, summarize shortcomings, put forward the direction that students should strive for in the future, guide students to master and correct deficiencies, and enhance the correctness of weak environments. ideas.

In the second stage, teachers can conduct random checks on students and ask students to report their presentation results. Based on the content of the student's report, the teacher and the student should jointly comment and question it. For example, when diagnosing problems in the formulation and process of "Butyl Rubber Synthesis Case", in the past, students could not clearly analyze the influence of "water" in cationic polymerization. The comments and questions of the teacher guide the students to think deeply, and then, under the guidance of the teacher, clarify the problem and effectively strengthen the learning effect.

4. Do a good job of summarizing and expanding after class

After class, students need to improve their learning tasks, which is also one of the key links in the flipped classroom teaching mode. After completing the task, learning needs to submit the results to the class, because students and teachers jointly grade the results. In addition, learning can be based on six aspects of the class Q&A and discussion environment, that is, from a subjective point of view, detailing gains, feelings, changes, actions, doubts and construction, and actively giving teaching feedback, which can not only allow teachers to fully understand students' learning levels. At the same time, it can adjust the teaching plan scientifically and reasonably to improve the teaching effect.

5. Conclusion

In the teaching of polymer chemistry, the effective application of flipped classroom can play a very important role in cultivating students' good skills, and is an important teaching method for cultivating skilled talents. The flipped classroom organically integrates new teaching concepts and teaching methods such as information technology, project-based teaching and task-driven mode, thereby effectively improving students' learning autonomy, and can also conduct multi-dimensional assessments on students, which is conducive to promoting students' learning. It plays a vital role in all-round development and improving the talent training level of Chinese people.

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